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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MORRISON, JAY A	
ART UNIT	**PAPER NUMBER**
2168	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/637,122	HENDERSON ET AL.	
	Examiner	Art Unit	
	Jay A. Morrison	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *67-127* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *67-127* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. Claims 67-127 are pending.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/13/2006 has been entered.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 67-127 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per claims 67-127, claim 82 defines machine readable storage medium as "carrier wave", and carrier waves, being a form of electromagnetic energy, do not fall into one of the statutory categories of 35 U.S.C. 101, the claims includes non-statutory subject matter. A detailed explanation describing why carrier waves are regarded as non-statutory subject matter under 35 U.S.C. 101 follows:

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

First, a claimed signal is clearly not a "process" under § 101 because it is not a series of steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents § 1.02 (1994). The three product classes have traditionally required physical structure or material.

"The term machine includes every mechanical device or combination of mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. (15 How.) 252, 267 (1854). A modern definition of machine would no doubt include electronic devices which perform functions. Indeed, devices such as flip-flops and computers are referred to in computer science as sequential machines. A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine.

A "composition of matter" "covers all compositions of two or more substances and includes all composite articles, whether they be results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids." Shell Development Co. v. Watson, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958). A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter.

The Supreme Court has read the term "manufacture" in accordance with its dictionary definition to mean "the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery." Diamond v. Chakrabarty, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11, 8 USPQ 131, 133 (1931), which, in turn, quotes the Century Dictionary). Other courts have applied similar definitions. See American Disappearing Bed Co. v. Arnaelsteen, 182 F. 324, 325 (9th Cir. 1910), cert. denied, 220 U.S. 622 (1911). These definitions require physical substance, which a claimed signal does not have. Congress can be presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change. Lorillard v. Pons, 434 U.S. 575, 580 (1978). Thus, Congress must be presumed to have been aware of the interpretation of manufacture in American Fruit Growers when it passed the 1952 Patent Act.

A manufacture is also defined as the residual class of product. 1 Chisum, § 1.02[3] (citing W. Robinson, The Law of Patents for Useful Inventions 270 (1890)).

A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 67-79 and 81-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cormen et al. ('Cormen' hereinafter) (Introduction to Algorithms, ISBN: 0262031318) in view of Sellis et al. ('Sellis' hereinafter) ("The R+-Tree: A

Dynamic Index For Multi-Dimensional Objects", Proceedings of the 13th VLDB Conference, Brighton 1987, pages 507-518).

As per claim 67, Cormen teaches

A tree data structure stored in a machine readable storage medium of a computer system to communicate information stored within the tree data structure in support of application(s) to execute on the computer system, the tree data structure comprising: (b-tree, page 381)

(a) a root node, wherein the root node comprises: (root, figure 19.1, page 381)

(i) a plurality of sequential keys, wherein each key comprises: (internal node has n[x] keys, figure 19.1, page 381)

and (b) a pointer associated with the root node to identify a child node, the child node comprising a range outside the range of each key in the root node. (n[x]+1 children, figure 19.1, page 381)

Cormen does not explicitly indicate "(1) a range for the key, (2) a first value to define a lower bound of the range for the key, and (3) a second value to define an upper bound of the range for the key, (ii) wherein the ranges of the plurality of sequential keys are non-overlapping".

However, Sellis discloses "(1) a range for the key, (2) a first value to define a lower bound of the range for the key, and (3) a second value to define an upper bound of the range for the key, (ii) wherein the ranges of the plurality of sequential keys are

non-overlapping" (rectangle contains low and high values, rectangles non-overlapping, page 511).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "(1) a range for the key, (2) a first value to define a lower bound of the range for the key, and (3) a second value to define an upper bound of the range for the key, (ii) wherein the ranges of the plurality of sequential keys are non-overlapping" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 68, Cormen teaches

at least one of the keys of the root node further include a data element. (satellite information stored in same node, section 19.1, page 384)

As per claim 69, Cormen teaches

at least one of the keys of the root node further includes a pointer to an associated data element. (pointer stored with key to satellite information, section 19.1, page 384)

As per claim 70, Cormen teaches

one of the keys of the root node further includes a pointer to a set of data elements. (pointer stored with key to satellite information, section 19.1, page 384)

As per claim 71, Cormen teaches

the set of data elements comprises a linked list. (linked list, section 11.2, page 204)

As per claim 72.

Cormen does not explicitly indicate "each data element of the set is associated with the range of the one key".

However, Sellis discloses "each data element of the set is associated with the range of the one key" (rectangle covered by object parent, page 511).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "each data element of the set is associated with the range of the one key" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 73,

Cormen does not explicitly indicate "one data element of the set is further associated with another one of the keys of the root node".

However, Sellis discloses "one data element of the set is further associated with another one of the keys of the root node" (G in rectangle A and P, figures 3.4 and 3.5, page 511).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "one data element of the set is further associated with another one of the keys of the root node" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 74,

Cormen does not explicitly indicate "the set of data elements is prioritized".

However, Sellis discloses "the set of data elements is prioritized" (figure 3.4, page 511).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "the set of data elements is prioritized" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 75,

Cormen does not explicitly indicate "a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix".

However, Sellis discloses "a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix" (figure 3.8, page 513).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 76,

Cormen does not explicitly indicate "a temporary node including a number of keys that is less than a minimum number of keys".

However, Sellis discloses "a temporary node including a number of keys that is less than a minimum number of keys" (orphaned rectangles, section 3.4, page 513).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "a temporary node including a number of keys that is less than a minimum number of keys" would have given those skilled in the art the tools to improve the invention by

storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 77,

Cormen does not explicitly indicate "a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node".

However, Sellis discloses "a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node" (section 3.5, page 513).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen and Sellis because using the steps of "a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node" would have given those skilled in the art the tools to improve the invention by storing data in a more efficient and useful manner. This gives the user the advantage of being able to more easily use the data in wider variety of applications.

As per claim 78, Cormen teaches

the range of the child node is between the ranges of two sequential keys. (figure 19.1, page 381)

As per claim 79, Cormen teaches

the range of the child node is beyond the range of an end key of the number of keys. (figure 19.1, page 381)

As per claim 81, Cormen teaches

the root node and the child node comprise a B-Tree data structure. (page 381)

As per claim 82, Cormen teaches

the machine readable storage medium comprises one of a memory device, a carrier wave, an optical storage device, and a magnetic storage device. (page 382)

As per claims 83-95,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 67-79 and are similarly rejected.

As per claim 96, Cormen teaches

the plurality of sequential keys are stored in contiguous locations of the machine readable storage medium. (page 382)

As per claims 97-109,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 67-79 and are similarly rejected.

As per claim 110, Cormen teaches

a processing device coupled with the machine readable storage medium. (page 382)

As per claim 111, Cormen teaches

the processing device includes logic to generate the tree data structure. (page 382)

As per claim 112, Cormen teaches

a set of instructions stored in the machine readable storage medium that, when executed on the processing device, generate the tree data structure in the machine readable storage medium. (page 382)

As per claim 113, Cormen teaches

the processing device includes a set of instructions stored thereon that, when executed on the processing device, generate the tree data structure in the machine readable storage medium. (page 382)

As per claims 114-126,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 67-79 and are similarly rejected.

As per claim 127,

the number of sequential keys are stored in contiguous locations of the machine readable storage medium. (page 382)

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cormen et al. ('Cormen' hereinafter) (Introduction to Algorithms, ISBN: 0262031318) in view of Sellis et al. ('Sellis' hereinafter) ("The R+-Tree: A Dynamic Index For Multi-Dimensional Objects", Proceedings of the 13th VLDB Conference, Brighton 1987, pages 507-518) and further in view of Puleston (Publication Number 2002/0181480).

As per claim 80,

Neither Cormen or Sellis explicitly indicate "the range of each of the keys correspond to a range of network addresses".

However, Puleston discloses "the range of each of the keys correspond to a range of network addresses" (paragraph [0013]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cormen, Sellis, and Puleston because using the steps of "the range of each of the keys correspond to a range of network addresses" would have given those skilled in the art the tools to improve the invention by storing network address in a well-known data structure. This gives the user the advantage of having quick access to network address during routing.

Response to Arguments

8. Applicant's arguments with respect to claims 1-66, now cancelled and re-drafted as claims 67-127, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record, listed on form PTO-892, and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jay A. Morrison whose telephone number is (571) 272-7112. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on (571) 272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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